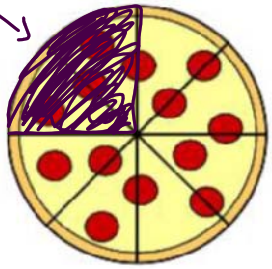
Name: _____ Date: _____
Period: _____ Mr. Valentino

Aim: How can we find area of sectors?

Do Now: You and your friends are sharing a pizza pie that is cut into 8 slices.

sector



1. If someone took two slices, what percent of the pizza is left?

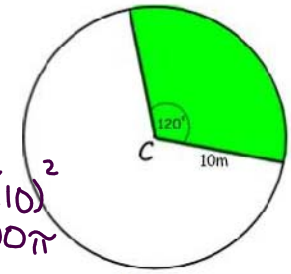
$\frac{6}{8} = \frac{3}{4} = .75 \rightarrow 75\%$

2. If the radius of the pizza pie is 8 inches, how much pizza is left?

In terms of π.

$A = \pi r^2$

$= \pi(8)^2 = 64\pi \text{ in}^2 \cdot 75\% \ (.75) = 48\pi \text{ in}^2$



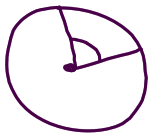
$A = \pi(10)^2$
$= 100\pi$

How much of the circle is shaded?

$\frac{120}{360} = \frac{1}{3} \rightarrow 33.\overline{3}\%$

How can we set up a proportion to find the area of the sector?

$\frac{\text{area of sector}}{\text{area of the circle}} = \frac{120^\circ}{360^\circ}$ (central $\angle$ of the sector)



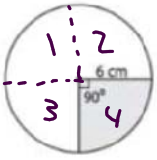
Area of a Sector

$A_{sector} = \frac{n}{360} \cdot \pi r^2$ n - measure of central angle of the sector

Practice Problems

Find the area of the shaded sectors in terms of pi

1.



$\frac{90}{360} = \frac{1}{4} = .25$

$\frac{1}{4} \cdot \pi r^2$

$\frac{1}{4} \cdot \pi(6)^2 = 9\pi \text{ cm}^2$

2.

$\frac{45}{360}$

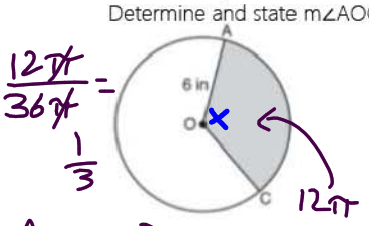
$\frac{1}{8} \cdot \pi r^2$

$\frac{1}{8} \cdot \pi(16)^2$

$\frac{1}{8} \ 256\pi$

$32\pi \text{ ft}^2$

3. In the diagram below of circle O, the area of the shaded sector AOC is 12π in^2 and the length of OA is 6 inches. Determine and state $m\angle AOC$.



$\frac{12\pi}{36\pi} = \frac{1}{3}$

$A = \frac{n}{360} \cdot \pi r^2$

$12\pi = \frac{x}{360} \cdot \pi (6)^2$

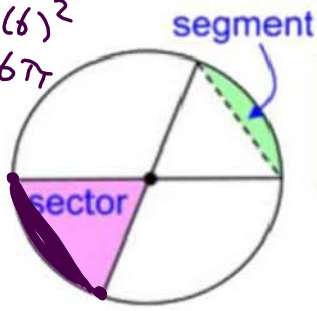
$12\pi = \frac{x}{360} \cdot 36\pi$

$\frac{12}{1} = \frac{36x}{360}$

$\frac{36x}{36} = \frac{4320}{36}$ $x = 120^\circ$

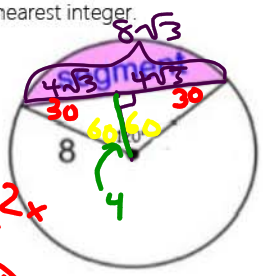
$A = \pi r^2$
$= \pi (6)^2$
$= 36\pi$

Area of a Segment



$A_{segment} = A_{sector} - A_{triangle}$

Find the area of a segment of a circle with a central angle of 120 degrees and a radius of 8 cm. Express answer to the nearest integer.



$A_{sector} - A_{triangle}$

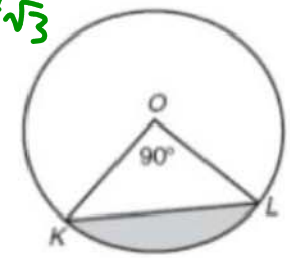
$\frac{n}{360} \cdot \pi r^2$ $\frac{1}{2} bh$

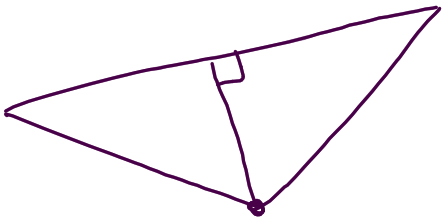
$\frac{120}{360} \cdot \pi (8)^2$ $\frac{1}{2}(8\sqrt{3})(4)$

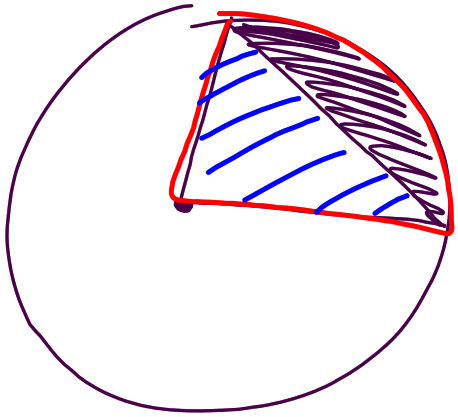
$67.020643328 - 27.712812921$

$39\ cm^2$

If the radius of the circle is 30 centimeters, what is the area of the shaded segment to the nearest whole number?

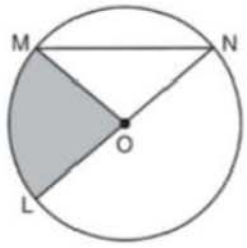




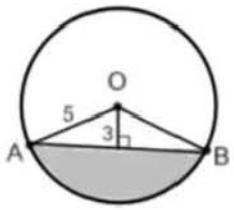


More Practice Problems

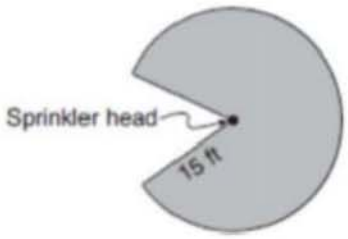
4. In the diagram below of circle O, the area of the shaded sector LOM is 2π cm^2 . If the length of NL is 6 cm, what is m∠N?



5. Find the area of the sector to the nearest whole number if m<AOB = 106.

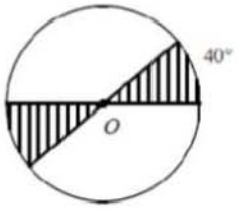


6. Cerise waters her lawn with a sprinkler that sprays water in a circular pattern at a distance of 15 feet from the sprinkler. The sprinkler head rotates through an angle of 300°, as shown by the shaded area in the accompanying diagram. What is the area of the lawn, to the nearest square foot, that receives water from this sprinkler?

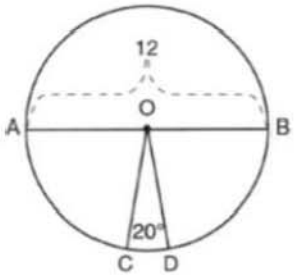
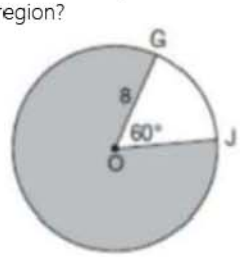


7. What is the area of a sector of a circle with a radius of 8 inches and formed by a central angle that measures 60° in terms of pi?

8. In the circle, O is the center. The radius of the circle is 6 feet. Find the total area of the shaded sectors to the nearest whole number.



9. In the diagram below of circle O, diameter AB and radii OC and OD are drawn. The length of AB is 12 and the measure of ∠COD is 20 degrees. If $\widehat{AC} \cong \widehat{BD}$, find the area of sector BOD in terms of π .



10. In the diagram below of circle O, GO = 8 and m∠GOJ=60°. What is the area, in terms of π , of the shaded region?